

Mimulus Memo



MARCH 2017

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EVENTS

MARCH

- 4 – Bryophyte Field Trip:
Kern Canyon,
- 16 – Chapter Meeting, 6pm
Program, 7pm
- 25 – Field Trip: Rancho Santa Ana
- 27-29 – Wildflower Conference
Kernville, CA
- 27-30 – CNPS Bryophyte Foray,
Three Rivers, CA

APRIL

- 1 – Field Trip: CALM
- 2 – Field Trip: Hungry Valley SRV
- 12 – Field Trip:
Western Mojave Desert
- 20 – Chapter Meeting, 6pm
Program, 7pm
- 29 – Field Trip: Salt Creek/Case
Mountain

MAY

- 18 – Chapter Meeting, 6pm
Program, 7pm

President's Message

A Good Year to See Plants from the Underground

by Richard Spjut

THIS WINTER HAS BEEN EXCEPTIONAL IN PRECIPITATION, making it a good year to see plants we rarely see in Kern County such as snow plant (*Sarcodes sanguinea*, **Fig. 1**), desert sand plant (*Pholisma arenarium*), broom rapes (*Orobancha spp.*), coral root (*Corallorhiza maculata*), and others, all belonging to diverse families: Ericaceae, Ehretiaceae, Orobanchaceae, and Orchidaceae, respectively. I refer to them as plants from the underground because that is where they live perennially, only surfacing annually to show off their flowers in order to reproduce. Underground, they steal nutrients from fungi or plants, either by their root or underground stem (rhizome) connecting with a specific fungal host that in turn forms symbiotic associations (mycorrhizal) with roots of other plants, usually shrubs or trees,



Photo: Richard Spjut, Yosemite Natl. Park, 5-15-09.

Fig. 1. Snow plant (*Sarcodes sanguinea*)

or by direct penetration into roots of host plants. In feeding underground, they have done away with photosynthesis, thus, no green leaves.

Probably most familiar is the snow plant, *Sarcodes sanguinea* in the subfamily, Monotropoideae of the heath family (Ericaceae); the epithet refers to the bright red color of the flowers. In Kern County its floral shoots often emerge from the ground during May to July (CCH¹). *Sarcodes* roots specialize in connecting to fungal thread-like cells (mycelium) of a truffle-like fungus,

“...a handful of soil can contain more than 5000 species”



Photo: Gordon Leppig & Andrea J. Pickart, — Wikipedia.

Fig. 2. Sugar sticks (*Allotropa virgata*) Humboldt Bay National Wildlife Refuge Complex



Photo: Wikipedia

Fig. 3. *Tricholoma magnivelare*, host for *Allotropia virgata*, Mendocino Co., CA

Rhizopogon ellena, which in turn connects with roots of white fir, red fir, or species of pine², all nestled together at the root base of snow plant into a bulbous mass network of mycelia and roots.

The mycorrhizal

(fungal tree root) association allows the tree to take up water and minerals in exchange for giving carbohydrates to the fungus. From the fungal perspective, it connects with two species of seed plants, one that photosynthesizes — to make food via chlorophyll converting sunlight into chemical energy — to fuel the reaction between carbon dioxide and water, and the other — the snow plant — providing nothing beneficial in return. Thus, it seems that the snow plant uses the fungal hyphae as feeding tubes to siphon off some of the nutrients being taken in by the fungus from the tree.

Other leafless monotropoids in Kern County are sugar sticks (*Allotropia virgata*, **Fig. 2**), found in the Greenhorn Mts., gnome plant (*Hemitomes confestum*), a rarely-seen species with coral-like flowers, known in Kern County from a single collection by **James Shevock** (Sep 1982) near the summit of Sunday Peak, pine drops (*Pterospora*) that occurs in the Greenhorn Mts., on Breckenridge

Mt., and on Mt. Pinos in the Iris meadow (CCH). They associate with other fungi, for example, sugar sticks associates with mushroom *Tricholoma magnivelare* (**Fig. 3**). The monotropoids are not saprophytes — species that live off decaying organic matter — as often indicated in the literature; rather, they are parasites because they take nutrients from living fungal mycelia without giving anything in return.

The coral root (*Corallorhiza maculata*, **Fig. 4**), a species of the orchid family, is widely distributed in the western U.S.³, mostly in the montane coniferous forest but also along coastal regions of California as far south as Monterey County.⁴ Its name reflects its coral-like underground stems and spots on its flowers. In the Sierra Nevada it occurs in Sequoia groves where sugar sticks may also be present. For Kern County, CCH has only one record, “Greenhorn Peak,” probably Greenhorn Pass, collected by **Gerald Griffith**, July 6, 1937 (RSA-POM); however, Twisselmann⁹ reported it occasional in montane pine and red fir forests of the northern Greenhorn Range. Its favorite hosts are mushroom genera of Russulaceae.

The genus *Orobanche* (broom rape) includes five or six species in Kern County. They parasitize roots of mostly shrubs, notably sagebrush (*Artemisia tridentata*), buckwheat (*Eriogonum fasciculatum*), yerba santa (*Eriodictyon californicum*), and rabbitbrush (*Chrysothamnus*), some species of *Orobanche* more selective to a specific host than others.

Two CCH specimens reported as rare plants from Piute Mt., (**Fig. 5**), may be a new subspecies. **L. R. Heckard** (1962, 1969, in annotations) noted that the flowers are atypical in their narrower corolla lobes and in their ovary of four placentae instead of two. One was collected by **Charlotte N. Smith**, 28 Aug 1943, on a westerly slope near the summit of Piute Peak along the road from Bodfish to French Meadows at 8000 ft, where she reported seeing only one plant growing in open among trees (fir, pine) with sage and *Ribes*. A later collection by Twisselmann — he identified as *O. grayana* var. *feudgei* (now *O. californica* ssp. *feudgei*) — was found on the southeast flank of Bald Peak where reportedly rare in openings in dense brush along a ridgetop on gravelly soil, 6300 ft (June 22, 1962). **L. R. Heckard** identified Smith’s specimen in 1962 as *O. corymbosa*, and in 1969 as *O. californica* ssp. *feudgei*. These specimens were again annotated in 2015 by **L. T. Collins**, **A. E. L. Colwell** and **G. Yatskevych** without further change. The subspecies is

Photo: Richard Spjut, May 12, 2009 Photo: Richard Spjut, July 2005



Fig. 5. Cancer root (*Orobanche fastigiata*) McCloud River near Shasta Lake **Fig. 6.** California broomrape, (*Orobanche californica*, ssp. *californica*) Coastal scrub Mendocino County, CA



Fig. 7. Desert Christmas tree (*Pholisma arenarium*).

generally found along mountain slopes bordering the western Mohave and Sonoran deserts. However in the Jepson Manual (2nd ed.), Colwell and Heckard indicated *O. californica* has subspecies to be named and described.

The most common *Orobanche* in Kern County is clustered broomrape, *O. fastigiata* (**Fig. 6**), represented by 21 of the 50 specimens in CCH for the county. The species is widely distributed in North America as also naked broomrape (*Artemisia O. uniflora*) represented by 7 CCH specimens. Both are also known as cancer root. The Montana Indian used the “parasite [*O. fasciculata*] on sweet sage [*Artemisia frigida*] roots...for cancer”, while other native Americans used *O. fasciculata* for treating wounds, sores and hemorrhoids.⁵ A sample of *O. cooperi* I collected in Baja California Sur in 1981 showed antitumor activity in the NCI astrocytoma assay. The broomrape chemically recognizes the Artemisia root by signaling strigolactones, plant hormones that have potential for treating cancer.⁶ Broomrapes have also been considered invasive to agricultural crops, especially in Europe and Asia⁷; yet, species native to the California deserts may be in decline.⁸

Pholisma arenarium (**Fig. 7**), commonly known as Christmas tree, scaly-stemmed sand plant, and purple sand food, which usually emerges in sandy places during May to June, was indicated by Twisselmann⁹ to be rare in Kern County; however, **M. Hall** and **H.P. Chandler** reported long ago (June 8, 1906, CCH) that it was “common from Hairwee Meadows to Red Rock Canyon.” This sand plant parasitizes roots of cheese bush (*Hymenoclea*) and rabbitbrush. A related species, which grows on the Algodones Dunes near Yuma AZ, *P. sonora* (**Fig. 8**), looks more like a mushroom. It was a favorite food of the Papagos (Tohono O’odham), but only seasonally since the plants emerge from the sand for short time, April to May, depending also on a good winter rain.¹⁰

Thus, if you are looking at what appears to be a mushroom growing out of the sand, it could be an inflorescence connected underground to mycelia of a mushroom or to the roots of other plants in a world where “a handful of soil can contain more than 5000 species.”¹¹ ❀

References:

- ¹ Consortium of California Herbaria (CCH), ucjeps.berkeley.edu/consortium. Regents of the University of California — Updated October 28, 2016. Data provided by the following participants, indicated by their herbarium acronyms: CAS-DS • CDA • CHSC • CSUSB • DAV • HSC • IRVC • OBI • PGM • RSA-POM • SBBG • SD • SDSU • SJSU • UC-JEPS • UCR • UCSB • UCSC.
- ² Kretzer AM1, Bidartondo MI, Grubisha LC, Spatafora JW, Szaro TM, Bruns TD. 2000. Regional specialization of *Sarcodes sanguinea* (Ericaceae) on a single fungal symbiont from the *Rhizopogon ellena* (Rhizopogonaceae) species complex. *Am. J. Bot.* 87(12):1778-82.
- ³ K. Magrath and J. V. Freudenstein, 2002. Orchidaceae, *Corallorhiza*. *Flora North America*. 26: 633-639.
- ⁴ D. Lee Taylor and Thomas D. Bruns. 1997. Independent, specialized invasions of ectomycorrhizal mutualism by two nonphotosynthetic orchids. *Proc. Natl. Acad. Sci.* 94: 4510-4515.
- ⁵ Moerman, D. E. *Native American medicinal plants. An ethnobotanical dictionary*. 1998. The medicinal uses of more than 3000 plants by 218 Native American tribes. Timber Press, Portland.
- ⁶ M. Fridlender, Y. Kapulnik and H. Koltai. 2015. Plant derived substances with anti-cancer activity: from folklore to practice. *Front. Plant Sci.*, 01 October <https://doi.org/10.3389/fpls.2015.00799>.
- ⁷ Fernández-Aparicio M, Reboud X, Gibot-Leclerc S. 2016. Broomrape Weeds. Underground Mechanisms of Parasitism and Associated Strategies for their Control: A Review. *Front Plant Sci.* 7:135.
- ⁸ Spjut, R. W. 2011. Decline in native annuals and increase in nonnative annuals in the California deserts. Pp. 348–358 in *Proceedings of the CNPS Conservation Conference: Strategies and Solutions*, 17–19 Jan 2009, eds. J. W. Willoughby, B. K. Orr, K.A. Schierenbeck, and N. J. Jensen.
- ⁹ Twisselmann, E. C. 1967. *A flora of Kern County, California*. Illustrated by Eben and Gladys McMillan. University of San Francisco. Reprint, Wasmann J. Biol. 25: 1–395.
- ¹⁰ Jaeger, E. J. 1940. *Desert Wild Flowers*. Stanford Univ. Press.
- ¹¹ W.H. van der Putten. 2017. Below-ground drivers of plant diversity: Feedbacks between soil microbes and plants affect the diversity of plant communities. *Science* 355 (6321, Jan 13):134-135.



Fig. 8. Desert sand food, (*Pholisma sonora*, older genus name *Ammobroma*), Algodones Sand Dunes, Imperial Co., CA, April 1980



CALIFORNIA
NATIVE PLANT SOCIETY

CNPS is the leader for providing reliable information on California native plants and plant conservation. Comprehensive information about California’s flora and vegetation communities is available throughout the state for conservation and educational purposes. CNPS’s leadership influences personal ethics and actions, as well as public policy for native plant protection.

Wild Irises in Kern A Delight to Behold

by Nancy Nies

IF YOU SHOULD HAPPEN TO VISIT THE meadow next to the top parking area on Mt. Pinos, you just might fall under its spell. In a good year, between May and July, you'll find that meadow abloom with *Iris missouriensis* — an enchanting sea of lavender. Some years ago, a couple I know was married in that iris-filled meadow. On 22 June 2016, Kern CNPS member **Suzanne Weller** saw the meadow and found inspiration for a poem.

Maynard Moe, in his *Kern County Flora*, lists four iris species growing in the wild here in Kern County. One was the subject of my article *Iris hartwegii: Lovely Native of California's Sierra Nevada* (Mimulus Memo, Sept. 2015). Another, *Iris pseudacorus* (yellow flag), a native of Europe and Asia, is an invasive plant and, says the **Society for Pacific Coast Native Iris (SPCNI)**, "a recent garden escapee [that] has become naturalized in much of temperate North America." Here, we'll focus on the remaining two

Above: Meadow of *Iris missouriensis*, Mt. Pinos, 5 July 2006

Right: *Iris missouriensis* (western blue flag), Mt. Pinos, 22 June 2016

irises found in Kern, California natives *Iris missouriensis* (western blue flag) and *Iris munzii* (Munz's iris).

The two flowers — with their three upright petals (the standards) and three downward-arching sepals (the falls) — share a widely varying, but similar, color range. *I. missouriensis* can be white to light blue to deep violet, and *I. munzii* can be white to pale blue to lavender to purple, say

the U.S. Forest Service and other sources. The sepals of the western blue flag have dark-purple veins and a yellow-white signal (a contrasting color down the middle), while those of Munz's iris have deep yellow, blue to purple to violet veining and a white or yellow signal. So, how do the two irises differ?

An important difference is that one is common and the other, rare. *I. missouriensis*, native to western North America, is widespread, from sea level to higher elevations. According to SPCNI, it is found "on the eastern side of the Cascade and Sierra Nevada mountains, from southern Canada to northern Mexico, and east to the Dakotas." Its bitter leaves unpalatable to livestock, it spreads so prolifically on grazed pasture land that some

cattle ranchers consider it a pest. In Kern County, says Moe, the western blue flag is "common in wet meadows and around seeps in the Jeffrey pine forest on Mt. Pinos."

I. munzii, on the other hand, is native and endemic to a small area in the foothills of the southern Sierra Nevada, from 1,800 to 4,000 feet. In Kern County, Moe places it "on wet, grassy sites, open to part shade; on easterly slopes near [the] road to Portuguese Meadow, Greenhorn Summit." CNPS lists *I. munzii* as being rare and endangered, and the Forest Service calls it imperiled, with only 6 to 20 populations or 1,000 to 3,000 individual plants.

The irises also differ in overall size. *I. munzii* grows two to three feet tall, with 3-5 large flowers per stalk and leaves 20 or more inches long and ¾ inch wide, says SPCNI, which calls this vigorous iris "the largest of the Pacific Coast natives — tall, straight, strong and stately." The western blue flag grows about a third to half as tall as Munz's iris, and has narrower leaves and smaller flowers, usually 1-2 per stalk.

Though I haven't seen *I. munzii* in person, I have read some personal observations that bear repeating here. **Richard Richards**, in "Iris munzii: A Partial View" (SPCNI Almanac, Fall 2001), writes that it was in the late 1960s that he first saw *I. munzii* growing at Coffee Camp, in the Sierra foothills near Springville, Tulare



Photo: Dana Nite@totalescape.com



Photo: Suzanne Weller



Photo © 2009 Irene Lindsey, Creative Commons

Iris munzii (Munz's iris), Coffee Camp area, 5 April 2009

Mt. Pinos iris
unfurls its late spring petals
blue and yellow flags

Jeffrey pines surround
lush luxuriant meadow
jewels in the crown

— Suzanne Weller

to find that the stands he'd previously visited had disappeared. *"The only explanation we could come up with is that passers-by had seen the attractive flowers and dug them on the spot,"* says Richards, who points out that Pacific Coast irises transplanted in the spring would never have survived, and that *"these people had one by one wiped out one of the most wonderful stands of I. munzii I have ever seen."*

On a more positive note, the SPCNI website reports that in April 2004, SPCNI sponsored Munz's iris trek to the Sierra foothills near Sequoia National Park, in Tuolumne County. Park ranger **Jennifer Atkins** and

County. *"Nowhere else have I ever seen such diversity of color and form as in the Coffee Camp I. munzii,"* writes Richards, who was to visit them every April for years thereafter. When he returned around 1990 after a 10- to 15-year hiatus, he was shocked

botanist **Cheryl Bartlett** took small groups of visitors *"to a shaded canyon where Iris munzii plants grew thick and tall under the dappled shade of blue oaks and buckeye trees along a dry streambank."* And on 1 May 2016, **Ann Huber** led Alta Peak CNPS members on a rare-plant treasure hunt *"to find and survey the Mineral King Road populations of the rare Munz's iris."*

Iris munzii — painting by Iris hybridizer and artist, **Jean Witt**

Huber reports (Insignis, June 2016) that they *"found many still in peak bloom, showing their exquisitely beautiful white to purple flowers."*

Let's hope that the beauty of a meadow of *I. missouriensis* or a rare stand of *I. munzii*, here in Kern County and elsewhere, will enthrall us for many years to come. ✿

Thank you to:

- ... **Rich Spjut** for sharing his considerable knowledge of taxonomic problems in Kern trees, shrubs and lichens at our Annual Potluck
- ... **Jana Borba** for sharing her knowledge and photos of the flowers found at Windwolves Preserve
- ... **Members** who provided the exceptional food at our Annual Potluck
- ... The following folks for providing food for people attending the **Important Plant Areas** meeting, Feb. 23-24, 2017:
 - Lucy Clark**
 - Fred Chynoweth**
 - Ellen Cypher**
 - Dorie & Gary Giragosian**
 - Clyde Golden**
 - Jerry Ludeke**
 - Karen Meeks**
 - Diane Mitchell**
 - Patricia Mumford**
 - Monica Tudor**
 - Vonnie Turkal**
 - Laura Stockton**
- ... to **Laura Stockton** for coordinating all the food donations
- ... to **Randi McCormick** for the use of her office to hold the meeting along with providing plates, napkins cups and utensils. ✿



FIELD TRIP SUMMARY

by Patty Gradek with Rich Spjut

FOR A MORE DETAILED DESCRIPTION OF field trips for the 2017 season, please see the January 2017 edition of the *Mimulus Memo*.



IMPORTANT: If your plans or your party's plans change and you will not be attending, it is critical for safety, planning and courtesy reasons – that you call or email the contact person and let them know you will not be there.

March 4, Saturday

KERN RIVER CANYON -
MILL CREEK, BRYOPHYTES
with Paul Siri Wilson and
Rich Spjut

Contact: Rich Spjut -
richspjut@gmail.com
RSVP Deadline: 8pm,
Tuesday, February 28



March 25, Saturday

RANCHO SANTA ANA BOTANIC GARDEN
with Travis Columbus and Joy England
Contact: Patty Gradek – pattygradek@gmail.com
RSVP Deadline: 8pm, Tuesday, March 21
Note: limited to 20 participants

April 1, Saturday

CALIFORNIA LIVING MUSEUM (CALM)
with Don and Yvonne Turkal
Contact: Patty Gradek – pattygradek@gmail.com
RSVP Deadline: 8pm, Tuesday, March 28

April 2, Sunday

HUNGRY VALLEY STATE
VEHICULAR RECREATION AREA
with Maggie Hurley
and Pam DeVries
Contact: Patty Gradek – pattygradek@gmail.com
RSVP Deadline: 8pm, Tuesday, March 28
Note: limited to 20 participants

April 12, Wednesday

WESTERN MOJAVE DESERT
with Rich Spjut
Contact: Patty Gradek - pattygradek@gmail.com
RSVP Deadline: 8pm, Friday, March 31

April 23, Sunday

WIND WOLVES PRESERVE
Contact: Patty Gradek – pattygradek@gmail.com
RSVP Deadline: 8pm, Tuesday, April 18

April 29, Saturday

SALT CREEK NEAR THREE RIVERS
with Denis Kearns and
members of the Alta Peak Chapter
Contact: Patty Gradek – pattygradek@gmail.com
RSVP Deadline: 8pm, Tuesday, April 25
ALL DAY - Note: limited to 25 participants

June 14, Wednesday

PIUTE MOUNTAIN/SADDLE SPRINGS ROAD
with Richard Spjut
Contact: Patty Gradek – pattygradek@gmail.com
RSVP Deadline: 8pm, Friday, June 9
ALL DAY - High-clearance vehicle with good tires
and 4-wheel-drive a plus.



Photo: Rancho Santa Ana Botanic Garden

Palo verde at Rancho Santa Ana Botanic Garden

OTHER EVENTS:

FOR A MORE DETAILED DESCRIPTION OF these events, please see the January 2017 edition of the *Mimulus Memo* or workshops listings online at www.cnps.org/workshops

March 1-3, 2017

VEGETATION MAPPING WORKSHOP
Redlands, California

March 27-29, 2017

2017 WILDFLOWER CONFERENCE
Kernville, California

March 27-30, 2017

BRYOPHYTES FORAY
Three Rivers, California

Apr 18 — 20, 2017

INTRODUCTION TO PLANT IDENTIFICATION
Tejon Ranch, Frazier Park, CA ☘

CONSERVATION CORNER

by Fred Chynoweth with Lucy Clark

CNPS HAS STARTED A STATEWIDE **Important Plant Areas (IPA)** mapping initiative to incorporate as complete a botanical dataset as possible into current land-use planning processes across the state, CNPS is asking regional experts to provide their expertise during our IPA Map development.

The first IPA meeting took place in Bakersfield on **February 23 -24, 2017** to map the Southern San Joaquin Valley. As of this writing, 20 have signed up to participate in the 2-day workshop sponsored by CNPS. Ultimately, the finished map and all subsequent maps will be hosted online as a viewable, update-able living record of IPAs in California. Much thanks goes to **Randi McCormick** for donating her office space for the project.

Saturday, January 14th, a group of us met to harvest pads of *Opuntia Basilaris* var. *treleasei*, Bakersfield cactus, which was growing on Tejon Ranch Conservancy property. Wind Wolves has agreed to grow them in their nursery. In about a year, we will plant the by-then-rooted cacti on the TNC's Toll House Ranch near Caliente.

Zach Principe, from **The Nature Conservancy**, has received a grant to repopulate that property held in trust. It was a good feeling to be part of a group effort (TNC, CNPS, and Wind Wolves) to help re-establish this species which is rare, very endangered and endemic to Kern County.

CNPS is actively tracking legislation at the state level and helping chapters advocate for conservation at the local level. At the CNPS website, a conservation report for 2015 -2016 may be downloaded. (<http://www.cnps.org/cnps/conservation/>) ❀

Chapter Meetings

upcoming TOPICS

Thursday, March 16, 2017 - 7 pm

Presenter: **Aaron Sims**
CNPS Rare Plants

Thursday, April 20, 2017 - 7 pm

Presenter: **Mitchell Coleman**
*Seedling Recruitment of *Atriplex polycarpa* (Chenopodiaceae) in the San Joaquin Valley*

Thursday, May 19, 2017 - 7 pm

Presenter: **Ann Huber**
*Kaweah Oak Preserve:
Oaks and their Conservation*

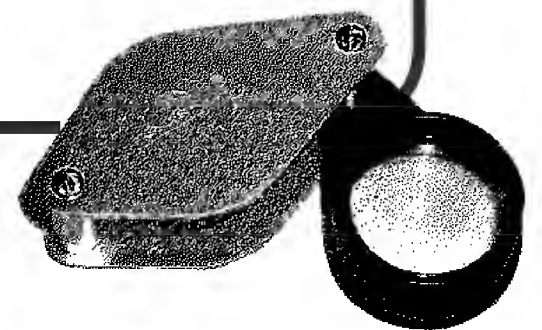
Thursday, June 20, 2017 - 7 pm

Presenter: **Ellen Cypher**
*Creating New Populations of an
Endangered Species: Recovery Efforts
for Bakersfield Cactus*

All chapter meetings are held the 3rd Thursday of each month at the Hall Ambulance Community Room 1031 21st Street (21st & N St.), Bakersfield, CA.

Meeting times:

6 pm — Discussion groups on plant identification and native plant gardening
7 pm — Program presentation



Left: The Cactus Collection Crew: (L to R) Lucy Clark, Ellen Cypher, Zach Principe, Monica Tudor (kneeling), Fred Chynoweth and Barbara Fleischer. Not pictured: Dinah Campbell **Right:** Ellen Cypher demonstrates the cutting technique.

Photos: Dinah Campbell





Mimulus Memo

Inside this Issue:

SEEING PLANTS FROM UNDERGROUND
WILD IRISES
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MEETING PLACE, DATES & TOPICS

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The Kern Chapter of the



California Native Plant Society meets
the third Thursday of each month at:
Hall Ambulance Community Room
1013 21st St. (21st & N St.), Bakersfield, CA.
Chapter website: kern.cnps.org

The California Native Plant Society is a non-profit organization dedicated to the conservation of California native plants and their natural habitats, and to increasing the understanding, appreciation, and horticultural use of native plants. CNPS has 31 chapters throughout the state and membership is open to all persons — professional and amateur — with an interest in California's native plants. Members have diverse interests including natural history, botany, ecology, conservation, photography, drawing, hiking and gardening. As a Kern County resident, your membership includes Eremontia, a quarterly journal with articles on all aspects of native plants; the Bulletin, a statewide report of activities and schedules; and The Mimulus Memo, the newsletter of the Kern Chapter.

Join CNPS or renew your membership online at www.cnps.org.

Student/ Limited Income – \$25

Individual – \$45

Family or Library – \$75

